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CLASS 17d

THOMAS WALTER BARBER IN WESTMINSTER

**Heating or Cooling Tube**

IMPERIAL [seal] PATENT OFFICE

## PATENT SPECIFICATION

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THOMAS WALTER BARBER IN WESTMINSTER

### **Heating or Cooling Tube**

Patented in the German on November 2, 1902.

The present invention relates to heating and cooling tubes in general, and water tubes for vats, preheaters, condensers, or the like in particular, and aims at increasing the heat conductivity of such tubes. This is sought to be achieved by the fact that all the parts of the same are brought into close contact with the tube walls by changing of the direction and the flow cross-section of the liquid.

In the accompanying drawings

Figures 1 and 2 show a form of embodiment of the object of the invention in two views.

Figure 3 is a section (a partial view) of a second form of embodiment.

Figures 4 and 5 are cross-sections according to 4-4 or 5-5 of Figures 1 and 3.

From Figures 1 and 2 it can be seen that a tube A is bent zig-zagged in such a manner that it is compressed at the bending points B simultaneously. The liquid flowing through thus continuously changes not only its direction but rather, as a consequence of the narrowing of the cross-section at the bending points, also its speed, whereby a very close mixture of the liquid particles is achieved and all the parts of the liquid are brought into contact with the tube wall.

In the form of embodiment according to Figures 3 and 5 not the tube A<sup>1</sup> but rather a core C disposed within the same is bent zig-zagged, although the effect is the same. This form of

embodiment is suitable in particular when the liquid to be vaporized contains particles which precipitate during the vaporization since the precipitate can be done away with by removing the core. It must be noted that it is insignificant whether the liquid is supposed to be heated or cooled, or even act as a heating means since in all cases the heat transfer is increased through the unique structure of the liquid path.

#### PATENT CLAIM:

Heating and cooling tubes, characterized by the fact that either the tube itself or a core disposed within the same is bent zig-zagged in such a manner that the cross-section of the tube (or core) narrows at the bending points for the purpose of achieving a close contact of all the liquid particles with the tube wall.

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1 Page of Drawings Appended

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